

AIDS TO THE IDENTIFICATION OF ARTIODACTYLAN HAIRS WITH GENERAL COMMENTS ON HAIR STRUCTURE¹

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(With six text-figures)

A system for rapid identification of hair specimens by means of hair impression studies is outlined. A series of camera lucida diagrams depicting the structure of hairs of some artiodactylan species is presented. This facilitates identification by permitting a direct visual comparison with the hair pattern of an unknown hair specimen.

INTRODUCTION

In nature it is very difficult to keep track of all the animals killed by the Tiger and one of the important methods of knowing the food habits is through collection of faeces containing hairs which will reveal the animal preyed upon by the Tiger. The prey animals cover a wide range of species which fall in the category of both domestic and wild animals. Primary need for studying food habit of carnivores in general and Felidae in particular prompted the authors to undertake study of hair structure of some wild Artiodactyla which forms the prey animals of carnivora.

The present work involves hair impression study.

MATERIAL AND METHODS

Initially, all hair specimens were carefully washed in hot water. They were air dried thoroughly. The medium for taking hair impression is prepared as follows:

A solution of cellulose acetate is obtained

by dissolving 2.5 g of cellulose in 10 ml of acetone and 40 ml of ethyl lactate are added to give a uniform viscous colourless solution.

A drop or two of this viscous medium is carefully spread over a clean microscope slide to give a uniform thin layer and a piece of the hair under investigation is placed on it immediately and allowed to stand for 10 minutes. The slide is then dried in an air oven at 55°C for about 30 minutes, when the hair piece can be easily lifted off. The clear impression obtained can be examined under a microscope by focussing on the medial region. The advantages of this method developed in the Forensic Science Laboratory, Bombay by Dr. M. S. Madiwale, are:

1. Even a small piece of hair can be studied as no stretching or fixing of hair is necessary.
2. As no stretching is done or pressure is applied, impressions obtained are reproducible.
3. Drying under reproducible conditions give faithful impressions which can be repeated.
4. Impressions are suitable for easy handling and preservation as record for future reference.

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The magnification of diagrams is $\times 940$.

OBSERVATIONS

The structural parts of a hair are cuticle, cortex, medulla, pigment and hair cells. In the system of hair identification to be outlined only cuticle is important. The structure of these patterns which form the basis of their identification under study are given along with macroscopic characteristics.

BLACK BUCK *Antelope cervicapra*

Fig. 1.

Gross Appearance:

Length 1 to 2 cm. The hairs look slightly curved and are more or less equal in diameter throughout except a gradual taper at apex. The diameter at the proximal end measures 48μ . The colour of hair is white in the proximal region with grayish coloured band immediately below the distal one third region. The terminal

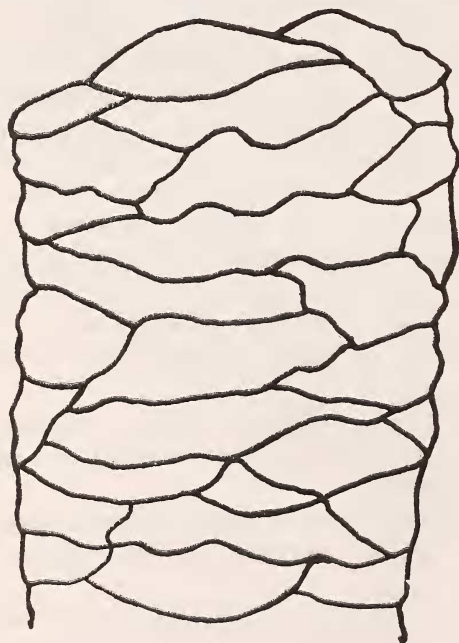


Fig. 1. Black Buck (*Antelope cervicapra*)

portion is black. Some hairs are pure light brown in colour and some pure white and black.

Microscopic Appearance:

Scales are imbricate with plain borders.

BARKING DEER *Muntiacus muntjak*

Fig. 2.

Gross Appearance:

Length 2 to 3.8 cm. The hairs look straight and more or less equal in diameter. The diameter at proximal region measures 112μ . The colour of hairs is brown with black tip. Others are white.

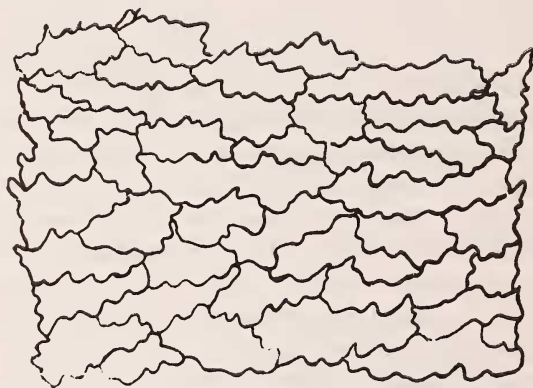


Fig. 2. Barking Deer (*Muntiacus muntjak*)

Microscopic Appearance:

Scales are imbricate with serrate edges.

SAMBAR *Cervus unicolor*

Fig. 3.

Gross Appearance:

Length 3 to 5 cm. They are narrow in proximal region, becoming broader in the medial and tapering off in the distal region. They measure 180μ in diameter in the medial region. The colour of hair is almost pure white in the proximal region, gradually changing to yellowish brown in the medial region. The distal region is black.

IDENTIFICATION OF HAIRS

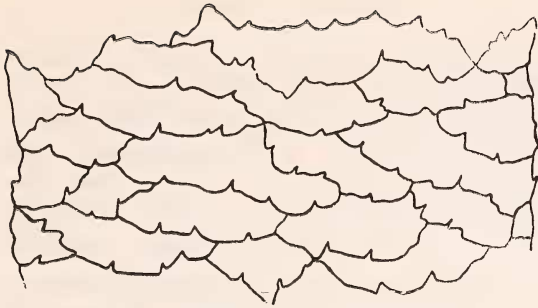


Fig. 3. Sambar (*Cervus unicolor*)

Microscopic Appearance:

The scales are imbricate with dentate edges.

SPOTTED DEER *Axis axis*

Fig. 4.

Gross Appearance:

Length 3 to 4 cm. Hair stems are slightly wavy. The diameter of the hair at the proximal region is 84 μ . The colour of the hair is white in the proximal region which changes to brown in the medial region. The distal region is yellowish brown.

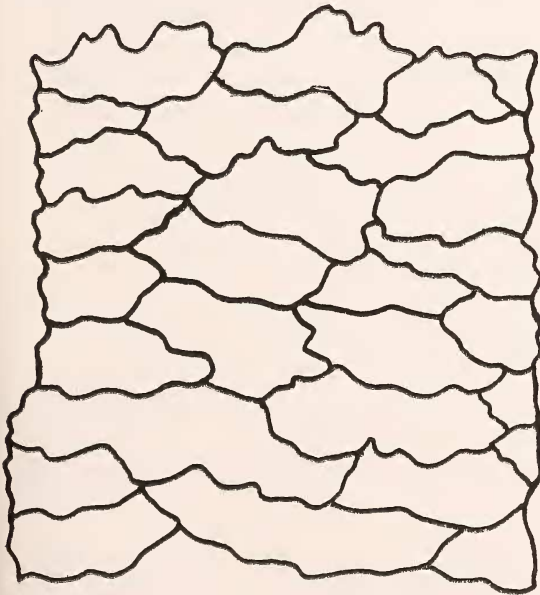


Fig. 4. Spotted Deer (*Axis axis*)

Microscopic Appearance:

The scales are imbricate serrate.

CHINKARA *Gazella gazella*

Fig. 5.

Gross Appearance:

Length 18 to 22 cm. The hair measures 54 μ in diameter in the proximal region increasing perceptibly in size in the medial region and then gradually tapering in the distal region. At the proximal region colour is generally black, medial region being greyish, and the distal region is white. Some hairs are pure white.

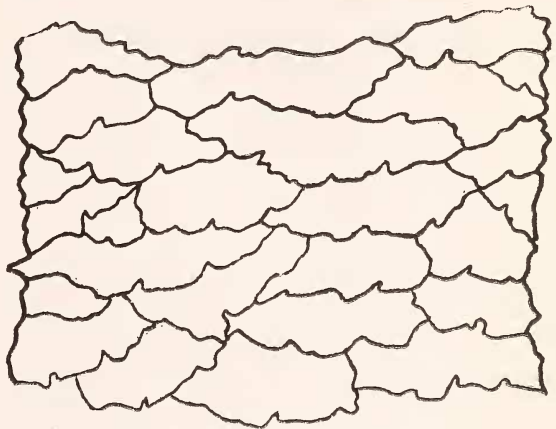


Fig. 5. Chinkara (*Gazella gazella*).

Microscopic Appearance:

Scales are imbricate with serrate edges.

NILGAI *Boselaphus tragocamelus*

Fig. 6.

Gross Appearance:

Length 23 to 27 cm. The hair at the proximal region measures 140 μ in diameter. Stems are quite fragile and easily broken. The colour of the hair is almost white in the proximal region. In the medial region two third portion is brown gradually changing to black in the distal region.

Microscopic Appearance:

The scales are imbricate with flattened edges.

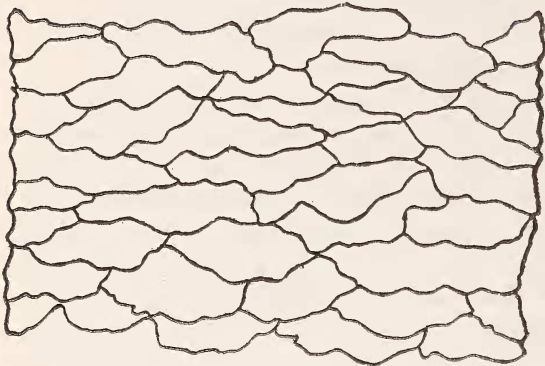


Fig. 6. Nilgai (*Boselaphus tragocamelus*).

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